

Borehole

10-02-10

Log Event A

Borehole Information

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|-------------------------|---------------------------------|---------------------------------|
| Farm : <u>A</u> | Tank : <u>A-102</u> | Site Number : <u>299-E25-88</u> |
| N-Coord : <u>41,226</u> | W-Coord : <u>47,746</u> | TOC Elevation : <u>688.88</u> |
| Water Level, ft : | Date Drilled : <u>2/28/1962</u> | |

Casing Record

| | | |
|----------------------------|--------------------------------|--------------------|
| Type : <u>Steel-welded</u> | Thickness, in. : <u>0.280</u> | ID, in. : <u>6</u> |
| Top Depth, ft. : <u>0</u> | Bottom Depth, ft. : <u>125</u> | |

| | |
|---------------------------------|----------------------------|
| Cement Bottom, ft. : <u>130</u> | Cement Top, ft. : <u>0</u> |
|---------------------------------|----------------------------|

Borehole Notes:

Borehole 10-02-10 was originally drilled in February 1962 to a depth of 75 ft using 6-in. casing. In 1978, the borehole was extended to a depth of 125 ft. The deepening operation involved installation of a temporary 8-in. surface casing to a depth of 18 ft and driving the original 6-in. casing to a depth of 130 ft. The 6-in. casing was retracted to 125 ft and 9 gal of grout was added to the bottom 5 ft of the borehole. The temporary 8-in. surface casing was removed. Thirty-six gal of grout was inserted into the void space between the permanent 6-in. casing and the borehole wall as the 8-in. casing was withdrawn.

"As-built" drawings for the A Tank Farm indicate the original borehole was constructed with 6-in., schedule-30 pipe; however, this type of pipe was not identified in applicable engineering references. The casing thickness for the borehole is assumed to be 0.280 in., on the basis of the published thickness for schedule-40, 6-in. casing. The top of the casing is the zero reference for the log. The casing lip is approximately even with the ground surface.

Equipment Information

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|-----------------------------------|---|--|
| Logging System : <u>2</u> | Detector Type : <u>HPGe</u> | Detector Efficiency: <u>35.0 %</u> |
| Calibration Date : <u>10/1996</u> | Calibration Reference : <u>GJO-HAN-13</u> | Logging Procedure : <u>P-GJPO-1783</u> |

Logging Information

| | | |
|---------------------------------|----------------------------------|------------------------------------|
| Log Run Number : <u>1</u> | Log Run Date : <u>11/13/1996</u> | Logging Engineer: <u>Bob Spatz</u> |
| Start Depth, ft.: <u>124.0</u> | Counting Time, sec.: <u>100</u> | L/R : <u>L</u> Shield : <u>N</u> |
| Finish Depth, ft. : <u>33.0</u> | MSA Interval, ft. : <u>0.5</u> | Log Speed, ft/min.: <u>n/a</u> |

| | | |
|--------------------------------|----------------------------------|------------------------------------|
| Log Run Number : <u>2</u> | Log Run Date : <u>11/14/1996</u> | Logging Engineer: <u>Bob Spatz</u> |
| Start Depth, ft.: <u>34.0</u> | Counting Time, sec.: <u>100</u> | L/R : <u>L</u> Shield : <u>N</u> |
| Finish Depth, ft. : <u>0.0</u> | MSA Interval, ft. : <u>0.5</u> | Log Speed, ft/min.: <u>n/a</u> |



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Logging Operation Notes:

This borehole was logged in two log runs. The total logging depth achieved by the SGLS was 124 ft.

Analysis Information

Analyst : S.D. Barry

Data Processing Reference : MAC-VZCP 1.7.9

Analysis Date : 02/20/1998

Analysis Notes :

The pre- and post-survey field verification spectra for all logging runs met the acceptance criteria established for peak shape and system efficiency. The energy calibration and peak-shape calibration from these spectra were used to establish the peak resolution and channel-to-energy parameters used in processing the spectra acquired during the logging operation.

Casing correction factors for a 0.280-in.-thick steel casing (based on a 6-in., schedule-40 pipe) were applied to the entire logged interval during the analysis process.

Shape factor analysis was applied to the SGLS data and provided insights into the distribution of Cs-137 contamination and into the nature of zones of elevated total count gamma-ray activity not attributable to gamma-emitting radionuclides.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations. Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

Results/Interpretations:

The only man-made radionuclide detected around this borehole was Cs-137. Cs-137 contamination was detected nearly continuously from the ground surface to 22.5 ft, at 95.6 ft, and at the bottom of the logged interval.

The K-40 log plot shows an interval of decreased concentration values from 10 to 15 ft. At about 80 ft, the K-40 concentrations increase slightly.

An analysis of the shape factors associated with applicable segments of the spectra was performed. The shape factor analysis for the interval from the ground surface to 19.5 ft is not valid because of the presence of grout on the outside of the borehole casing.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data



Spectral Gamma-Ray Borehole
Log Data Report

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Reports for tanks A-101 and A-102.